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UNUSUAL FLIGHTS OF THE GROUSE LOCUST  
(*TETTIGIDEA LATERALIS* SAY,) IN NORTH  
EASTERN ILLINOIS.

BY JOSEPH L. HANCOCK.

At certain times, seemingly without premonitory indications, some insects suddenly change their habitat; although closely allied forms inhabiting the same locality under similar general influences, show no disposition to do so. That there are predisposing conditions which are the ruling causes of these specific migrations is plainly evinced by careful study. Before confining our remarks to a single species *Tettigidea lateralis* Say, "The Grouse Locust" as an illustration in point, a sketchy recapitulation of the phenomena of migration in the family Acrididæ, of which the above is a member, may be given to some advantage. The various forms of grasshoppers, constituting this large family, are not as a rule migratory; as a matter of fact, somewhere near a dozen only are given to making sudden sweeping changes, by flight over a large territory foreign to their hatching grounds. In two species, whose anatomical differences are but very slight, one may be truly migratory while the other is not, as seen for example, in *Melanoplus spretus* and *Melanoplus femurrubrum*. The confusion arising from an indefinite interpretation of migration in its truest sense, as distinguished from the shorter "local flights" as applied to insects, is often perplexing. Let us attempt to set at rest, as far as possible, such misconception of terms.

Individuals of a species which effect a more or less regular periodical change in their habitat, are truly migratory. Migrations may be primary, consisting of local flights; such as movements by insects hatched in temporary regions to which they confine themselves to passing to and fro, from point to point, or secondary, as the repeated periodical changes of residence covering foreign fields, which virtually establishes a nomadic habit. We have hinted that there are predetermining

conditions effecting these movements, principal among them being a break in the interrelation of food supply, or improper conditions for the carrying on of propagation. The unusual appearance of insects in a given locality, classed under the category of primary or "local flights," are met with occasionally by observers. One of considerable moment is set forth in the following narration: On the nineteenth of September, 1893, the Grouse Locust, with a few other members of *Acrididae*, striking out for more favorable conditions, landed at night in swarms in Chicago. The writer noticed them everywhere in the city. The small size of this locust (♀, ♂—12–16 mm.) in length, with peculiar inconspicuous colors, caused them to be overlooked by the people passing the next day who, without being conscious of the fact, crushed thousands under their feet, leaving tiny stains upon the sidewalks. Again, two days following their first appearance, on the twenty-first inst., multitudes of Grouse Locusts dropped during the night. As individuals, they were comparatively large and vigorous. Many were taken to indicate the range of flights; specimens being recorded at scattered points. A region covering, not only the City of Chicago, but the northeastern portion of Illinois and that part of Indiana including the lower bend of Lake Michigan adjacent, as shown in the accompanying map Fig. 4, was represented. Observations in the city showed that the electric arc lights, to which they were attracted, killed off large numbers, while the stretch of waters in the lake destroyed others.

Through the streets, in the heart of the city, the writer collected in a short time, twenty-seven specimens, comprising thirteen males and fourteen females, showing a remarkably even distribution of sexes. A significant point indicating the direction from which they came was gathered from the fact that most, if not all the specimens, when examined, on the streets running east and west, were on the north side of the street, showing that they were blown against the tall buildings and then dropped to the ground. Information received from Mr. H. C. Frankenfield, local forecast official, who kindly favored the writer with a report, giving the direction of the wind

at the time of the flights, is appended below. It is interesting to note that the preconceived idea of their course was confirmed. His report indicated that the wind during the twenty four hours which brought in the Grouse Locusts on the night of the nineteenth inst. blew from :

Southeast 2 Hours.

South 3 Hours.

Southwest 19 Hours.

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Total 24 Hours.

The general direction pointing from the southwest. In the second flight the wind blew from :

East 1 Hour.

Southeast 18 Hours.

South 4 Hours.

- Southwest 1 Hour.

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Total 24 Hours.

Showing a mainly southeastern wind.

Nothwithstanding a residence of many years in this locality, no other instance of unusual migration of this particular species has been observed, except during the preceding fall, 1893, which was characterized also by flights in very small numbers, marking the first instance of their occurrence here. Of the natural breeding grounds of this species, but little is known in this section of the State of Illinois, beyond the fact of their existence along the Des Plains River at Riverside. In general terms, it may be inferred that the natural habitat is along the border of streams (J. H. Comstock<sup>1</sup>), about ponds (W. S. Blatchley<sup>2</sup>), in the vicinity of mud flats and low marshy places. The species is sub-aquatic in habit and widely distributed. (Lawrence Bruner<sup>3</sup>).

The predetermining causes of the singular flights noted above, may have been induced one way or another by the extreme dryness of the fall seasons of 1892-3. Indeed it is safe to assume that these conditions played a direct part, as will be

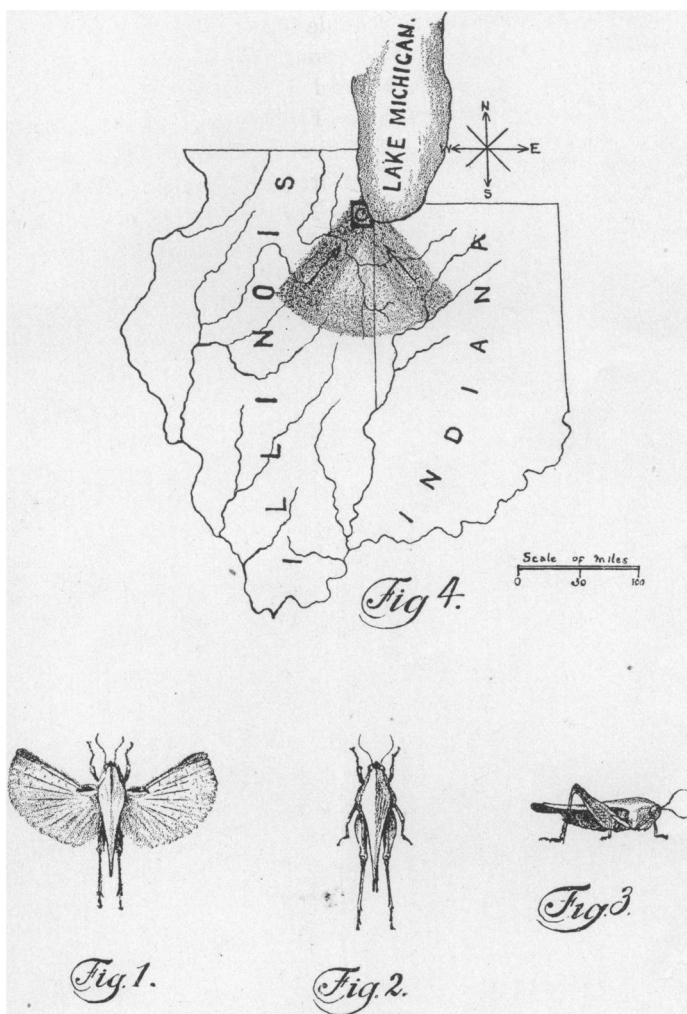
<sup>1</sup>Introduction to Entomology.

<sup>2</sup>From specimens so labeled in my collection.

<sup>3</sup>MS. letter.

seen from the following observations. On September 16, 1893, it was observed that the large stream at Riverside, a few miles west of Chicago, was so low that in many places one could travel across on the limestone bed, a thing before impossible. Along the banks of this stream Orthoptera appeared uneasy and much affected by the heat prevailing at the time. To the southeast and southwest, the directions from which the Grouse Locusts were blown, for miles the broad stretch of marshes, sloughs, small streams, ponds and lakes were dried, changing decidedly the topography of the districts. The effect upon animal life was to cause the shifting about of many kinds. The young grasshoppers, unusually favored, passed on to maturity aided by a scarcity of birds, their natural enemy, moreover, circumstances on every side being favorable, allowed excessive numbers to develop. Multitudes infested the regions where usually a few existed. By late fall the soil was baked by the heat, giving rise to a difficulty in finding a suitable place to deposit their eggs. Later, still further changes were enacted, for those habits ordinarily sedentary, now took on a tendency to be nomadic. Simultaneously, a kind of restless irritation took possession of the insect. Rising in the air in short flights to rid themselves of distress, aimlessly they pursued these movements through the day seeking for shelter. Ere long, a wind rushing in to take the place of the rarefied air, moving upward, bears off to distant points those caught up in its irresistible powers. Upper air currents may blow from three to twenty miles an hour, so basing an estimate on these grounds, a day's flight may be approximated at from twenty to one hundred miles. When subjected to a test the Grouse Locust's flight, ordinarily, is quite prolonged, being swift and noiseless. Referring again to the map Fig. 4, (shaded portion) an idea may be gained of the local flights of this little locust. If the furthest point be placed at one hundred miles distant from Chicago, the local point of observation, taking into consideration also the specimens found, the section of northeastern Illinois including the Kankakee River and its branches, the outlying marshy districts, various streams, ponds and tributaries of the Illinois River and the section

# PLATE XIII.



*Tettigidea and its Migrations.*

swept as shown on the shaded portion of the map in the north western corner of Indiana, contributed specimens to the flights. While more or less speculative, this paper is a step toward establishing a knowledge of the migrations in the Grouse Locust, of which little has been said by previous writers.

#### EXPLANATION OF PLATE, No. XIII.

Fig. 1, 2 and 3, *Tettigidea lateralis* Say, all natural size ; from nature.

Fig. 1. Female with wings extended.

Fig. 2. Seen from above.

Fig. 3. Side view.

Fig. 4. Map showing flights of *T. lateralis* in 1893.

Clouded area indicating supposed habitat and section covered by the flights.

[c]. Chicago, local point of observation.

*Chicago, Feb., 1894.*